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## A NATURAL GROUP OF UNUSUAL BLACK OAKS.

(PLATES II TO IV.)

By WILLIAM TRELEASE.

(Read April 21, 1921.)

Though most oaks bear only one or two acorns in a leaf axil, it is recognized generally that even when essentially sessile these fruits and the flowers that produce them really pertain to a reduced pistillate catkin which is comparable with the staminate catkin. Sometimes the fertile flowers, though close together, are raised on a rather long peduncle, a condition well shown by our swamp white oak (*Quercus bicolor*) and the English oak (*Q. pedunculata*, or *Q. Robur pedunculata*). Several groups of Mexican and Central American white oaks have similarly long-peduncled acorns, e.g., those centering about *Q. macrophylla*, *Q. peduncularis* and *Q. reticulata*. In some of these, as in an exceptional ally of our own southern live oak *Q. virginiana*, occasional acorns occur along the peduncle; and in *Q. decipiens* of the eastern Sierra Madre these are frequent enough and the rachis is long enough to make the inflorescence in fact a sort of loose spike or catkin.

All of these belong to the section of white oaks, *Leucobalanus*, which are characterized technically by their short broad stigmas, basal abortive ovules, and the glabrate interior of the acorn shell.

The purpose of this paper is to make known three black oaks of the southern Mexican mountains which are quite unique in their section of the genus in bearing their fruit in racemes—or more properly spike-like clusters. They possess the technical characters of the black or red oak section, *Erythrobalanus*: elongated spatulate stigmas, subapical abortive ovules, and acorn shells tomentose within; but they differ from most black oaks and agree with all white oaks in maturing their fruit in the course of the season of

flowering instead of deferring fertilization and maturation of fruit for a year.

The first of these species was collected by Dr. J. N. Rose of the United States National Herbarium in the mountains of Tepic in 1897; the second, by Monsieur E. Langlassé in the Sierra of Michoacan or Guerrero in 1899; and the third, by Professor C. Conzatti of Oaxaca in the southern Cordillera in 1907. They constitute a natural group which in some respects suggests relationship with that embracing *Q. crassifolia*, *Q. fulva* and *Q. stipularis*, which likewise mature their fruit in the first season though differing greatly in some other respects. The common and differential characters of these new species may be stated thus:

*Racemiflorae*.—Moderately large trees with stout tomentose twigs, rounded buds, large cordate pandurate-obovate or orbicular concave aristately dentate petioled leaves impressed-veiny above and tomentose beneath, and small annual fruit in elongated raceme- or spike-like catkins, the thin cupules with tomentose scales.—Western Sierra Madre and southern Cordillera of Mexico.

Petioles long (20–30 mm.).

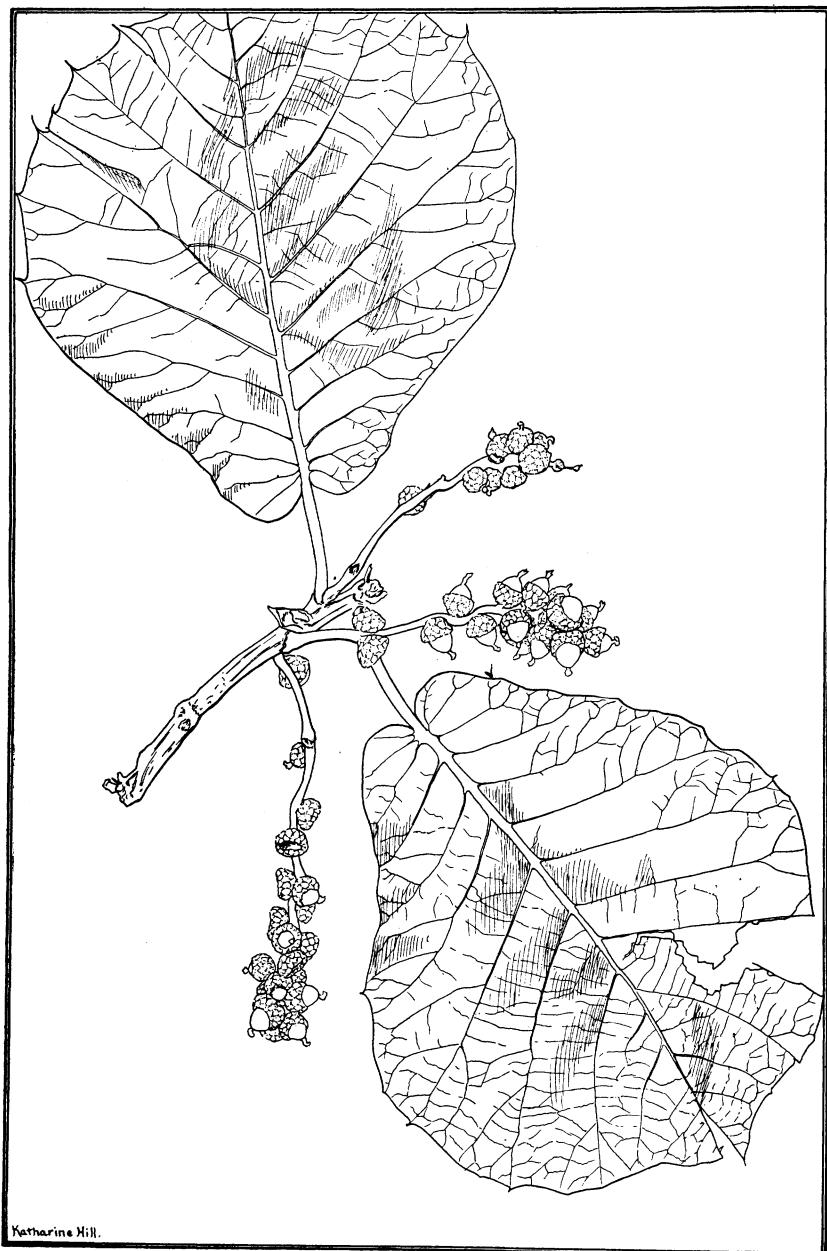
Leaves longer than broad, somewhat repand.....*Q. Urbani*.  
Leaves isodiametric, aristate from the nerves.....*Q. radiata*  
Petioles short (scarcely 15 mm.): leaves isodiametric.....*Q. Conzattii*.

#### *Quercus (Erythrobalanus) Urbani* n. sp.

A tree 8–10 m. high, with tortuous trunk. Twigs stout, with dense yellowish tomentum persisting through the second season. Buds rounded, somewhat tomentose. Leaves large (15 x 16 cm.), deciduous, pandurate-subobovate, shortly acuminate, cordate-auriculate, lightly hollowed between the aristate ends of the veins, convex, glossy and glabrous except for the impressed veins above, densely creamy-tomentose beneath; petiole yellow-tomentose, 3 x 25 mm. Flowers unknown. Fruit annual, small, in yellow-tomentose spikes 80–110 mm. long, densely flowered toward the end; cup small (10 mm.), hemispherical, with thin appressed blunt fulvous-tomentose scales; acorn ovoid, 10 mm. long, canescent.

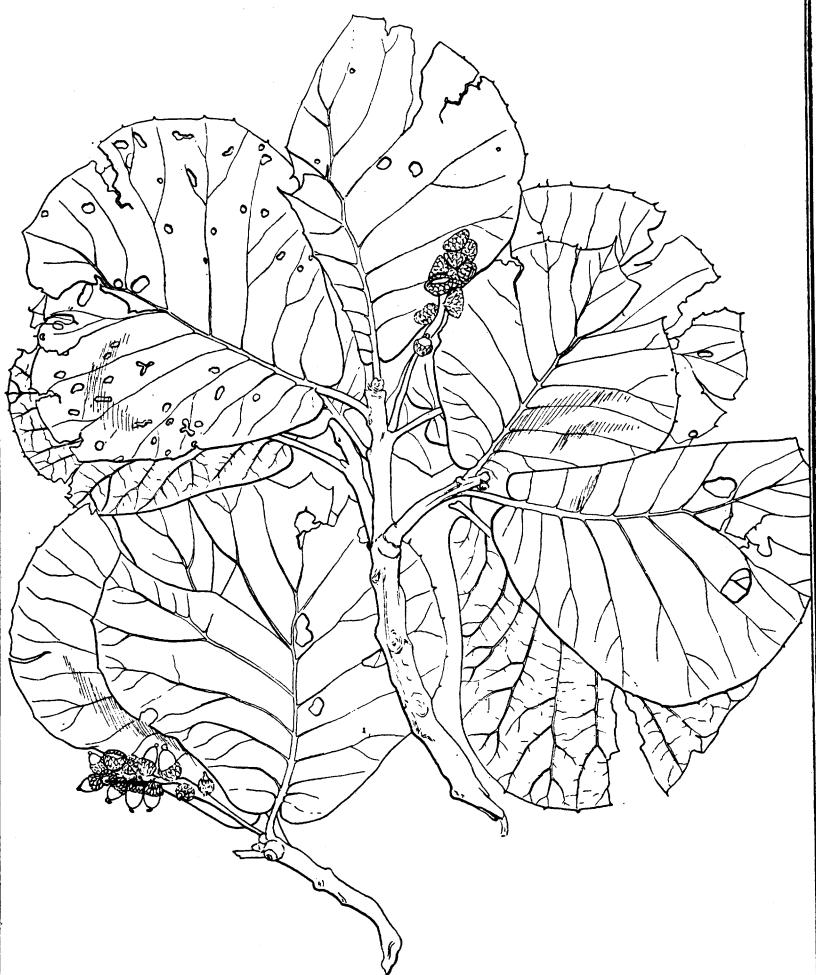
Called encino cucharilla, from its deeply spoon-shaped leaves.

Western Sierra Madre of Mexico, at 1,800 m. (*Langlassé*, 1066, June 20, 1899), from Michoacan or Guerrero,—the type in the herbarium at Dahlem, for the privilege of studying which I am indebted to Professor Ignaz Urban, of that institution.



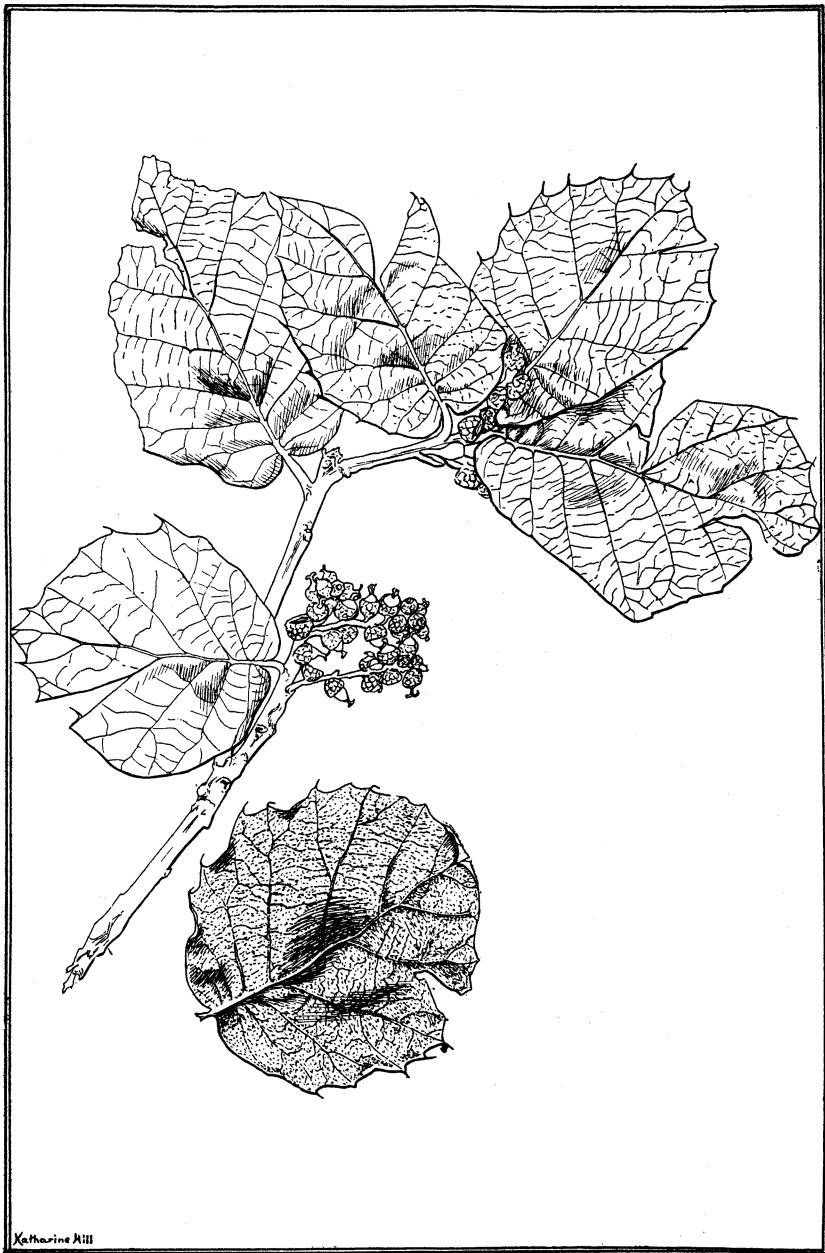
Katherine Hill.

*Quercus Urbani.*



Katherine Hill

*Quercus radiata.*



Katharine Hill

*Quercus Conzattii.*

*Quercus (Erythrobalanus) radiata* n. sp.

Twigs stout, densely yellowish-tomentose, remaining somewhat velvety for several seasons. Buds rounded, small (2–3 mm. in diameter), somewhat tomentose. Leaves large (9–13 cm. long and broad), deciduous, pandurate-orbicular, at most deltoid-pointed, cordate-auriculate, not hollowed between the radiate aristate ends of the veins, dull and glabrous except for the impressed veins above, detachably rusty-tomentose beneath with the denuded surface somewhat bullulate; petiole yellow-tomentose,  $3 \times 10\text{--}15$  mm. Flowers unknown. Fruit annual, very small, in somewhat loosely yellow-stellate spikes 60–80 mm. long, densely fruited above the middle; cup very small (7–8 mm.), hemispherical, with thin appressed blunt fulvous-tomentose scales; acorn elongated ovoid, 8 mm. long, canescent.

Western Sierra Madre of Mexico (*Rose*, 2230, Aug. 13, 1897), from the top of the range near Santa Teresa, Tepic,—the type in the United States National Herbarium, for the privilege of studying which I am indebted to Dr. Rose, of that institution.

*Quercus (Erythrobalanus) Conzattii* n. sp.

Twigs stout, gray-tomentose even through the second year. Buds ovoid, rather small ( $3 \times 5$  mm. or more), somewhat hairy. Leaves large ( $8\text{--}10 \times 9\text{--}12$  cm.), deciduous, orbicular, very obtuse to short-acuminate, cordate, very slightly hollowed between the tips of the aristate veins, glossy, glabrous except for the impressed veins and convex above, densely grayish-woolly beneath; petiole gray-tomentose,  $3 \times 5\text{--}15$  mm. Flowers unknown. Fruit annual, small, in woolly spikes 40–50 mm. long, densely fruited throughout; cup small (scarcely 10 mm.), hemispherical, with thin appressed blunt glabrate scales; acorn ovoid, scarcely 10 mm. long, canescent.

Southern Cordillera of Mexico, at 2,000 m. (*Conzatti*, 1900, June 29, 1907), from the Cuesta de Huauchillo, Nochixtlan, Oaxaca,—the type in the herbarium of the Field Museum at Chicago, for the privilege of studying which I am indebted to Dr. C. F. Mills-paugh, of that institution.

## EXPLANATION OF PLATES.

Illustrations, reduced one half, of the types of *Quercus Urbani*, *Quercus radiata* and *Quercus Conzattii*; from photographs by the author.